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Career summary

I obtained my Ph.D. in 2014 at the IST - Instituto Superior Técnico, University of Lisbon, Portugal. In my thesis, I proposed a new method to reconstruct the longitudinal profile of the muon component of air showers using the surface detector array of the Pierre Auger Observatory. From 2014 to 2016, I worked at the Institute of Physics Gleb Wataghin, UNICAMP, Brazil, with a FAPESP post-doc fellowship. From 2016 to 2017, I worked at the ITeDA with a CONICET post-doc fellowship. During these three years, I focused my research on the reconstruction of the longitudinal profiles of the muon component using the surface and underground detector arrays of the Pierre Auger Observatory. Since 2017, I have worked at the Institute of Physics of the Czech Academy of Sciences in Prague. Since 2020, I have been the coordinator of the Monte Carlo simulations task of the Pierre Auger Observatory. In 2022, I integrated the Pierre Auger Conference Committee. Since 2021, I have been the PI of the GA ČR Junior Star 2021, with the title Extensive air showers as probes of hadronic interactions beyond the LHC energies. Under the GA ČR Junior Star, I have set up a team of eight people: three senior researchers, one researcher, two post-docs, two Ph.D. students, and also two Master's students.

Professional Activities

- 2022– Production of the full *AugerPrime* Review 2023 Monte Carlo simulation library
- 2022– Member of the Auger Conference Committee - Pierre Auger Collaboration
- 2021– **GA ČR Junior Star 2021 - Principal Investigator**
- 2020– Coordinator of the Monte Carlo Simulations task - Pierre Auger Collaboration
- 2018– Grid production of standard multipurpose Monte Carlo libraries for cosmic ray studies

Education

- 2009–2014 Ph.D., Physics, University of Lisbon, IST, Portugal
Thesis Title: Measurement of the muon production depth with a time-domain fit at the Pierre Auger Observatory
- 2007–2008 M.Sc., Physical Engineering, Technical University of Lisbon, IST, Portugal
Thesis Title: Design optimization of Muon counters for Auger Observatory
- 2000–2006 B.Sc., Physical Engineering, University of Algarve, Portugal
Thesis Title: The nature of optically faint μ Jy sources from a deep radio survey (In Portuguese)

Working experience

2020–	Researcher, FZU - Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic
2017–2019	Post-doc, FZU - Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic
2016–2017	CONICET Post-doctoral fellow, ITeDA - Instituto de Tecnologías en Detección y Astropartículas, San Martín, Buenos Aires Province, Argentina
2014–2016	FAPESP Post-doctoral fellow, UNICAMP - Instituto de Física Gleb Wataghin, Campinas - SP, Brazil
2008–2009	Research fellow, LIP - Laboratório de Instrumentação e Física Experimental de Partículas, Lisbon, Portugal

Supervision

2019–2020	Consultant of Bachelor Thesis of Karolína Syrovkaš, Czech Technical University
2021–2022	Supervisor of Research Project of Antonín Kravka, Czech Technical University
2022–	Supervisor of Master's thesis of Antonín Kravka, Czech Technical University

Conferences - 2017–2022: Oral contributions

- [1] **Santos, E.**, for the Pierre Auger Collaboration (2022). Muon measurements at the Pierre Auger Observatory. XI International Conference on New Frontiers in Physics, Kolymbari, Crete, Greece.
- [2] **Santos, E.**, for the Pierre Auger Collaboration (2018). Highlights of Pierre Auger Observatory. International Workshop on Frontier Research in Astrophysics -III. Palermo, Italy.

Posters

- [1] **Santos, E.**, et al., (2022) Reconstruction of the muon production longitudinal profiles in extensive air showers. 6th International Symposium on Ultra High Energy Cosmic Rays, L'Aquila, Italy.
- [2] Tuneu, J., Filip, P., **Santos, E.**, (2022) On the mystery of the multi-muon flux at the TeV cosmic-ray energy range. 6th International Symposium on Ultra High Energy Cosmic Rays, L'Aquila, Italy.
- [3] **Santos, E.**, for the Pierre Auger Collaboration (2021). Monte Carlo simulations for the Pierre Auger Observatory using the VO auger grid resources. 37th International Cosmic Ray Conference, Online.
- [4] **Santos, E.**, for the Pierre Auger Collaboration (2018). Searches for ultrahigh-energy neutrinos from gravitational wave events with the Pierre Auger Observatory. 26th Extended European Cosmic Ray Symposium and 35th Russian Cosmic Ray Conference, Altai State University, Barnaul, Russia.

Publications

- [1] Convener of the High-Performance Computing section of the Ultra-High Energy Cosmic Rays: The Intersection of the Cosmic and Energy Frontiers Snowmass 2021 white paper, [arXiv:2205.05845](https://arxiv.org/abs/2205.05845).
- [2] Co-author in 90 peer-review publications in the Pierre Auger Collaboration, 30 of which in the past 5 years.
- [3] Co-author in 9 peer-review short author papers, 3 of which in the past 5 years.
- [4] Main-author in 5 conference proceedings in the past 5 years.

Spoken languages

English	Fluent (speaking, reading, writing)
Spanish	Fluent (speaking, reading, writing)
Czech	Basic
Portuguese	Native